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Abstract. At Effigy Mounds National Monument in northeast Iowa, the National Park Service is conducting a program to rehabilitate Indian burial mounds which were damaged by unknown individuals before the park was established. The program is described relating the historical background and reasoning for it to the basic purposes of the National Park Service. The use of archeological methods results in the retrieval of data and information that would otherwise be lost or remain unknown. Soil monoliths and other soil samples were collected for detailed analysis at a later time in connection with studies of prehistoric environments. Two basic and inexpensive steps for repairing damaged mounds are suggested for agencies with limited budgets.

In June 1965 the National Park Service at Effigy Mounds National Monument in northeast Iowa continued its program of rehabilitating Indian burial mounds which are the primary resource of Iowa's first National Park area. Effigy Mounds was established to preserve and protect burial mounds of various shapes such as conical or dome-shaped mounds, linear mounds, and combinations of the conical and linear forms called compound mounds. The most unusual of the mounds, however, are those built in the shape of some animal. These are the effigy mounds after which the monument was named. Such mounds were constructed only in the southern half of Wisconsin and the neighboring counties of Iowa, Illinois, and Minnesota. Bird and bear mounds are the animals most commonly represented and are the only effigy forms found within the boundaries of the Monument. Other forms include turtles, panthers, lizards, canine, deer, and eccentric forms.

Altogether there are 191 known prehistoric mounds of all types at the Monument. When Effigy Mounds National Monument was established in 1949 many of the mounds had been damaged by farming or lumbering activities. Even more damaging to the mounds was the work of thoughtless and untrained persons which began in the period after the Civil War. By that time the nature of the mounds was recognized and people dug into them looking for arrowheads or prehistoric relics of one kind or another. Most of the mounds probably did not produce very much in the way of grave offerings. A few of them proved, however, to be notably rich in such things as tobacco pipes of carved stone, whole pottery vessels, and stone

[1] Effigy Mounds National Monument, McGregor, Iowa

and copper implements. Such finds encouraged further haphazard digging so that few of the mounds escaped the hand of the "pot hunter."

Unfortunately these people rarely kept records or wrote descriptions of what was found. The result was the loss of a great amount of knowledge concerning the mound-builders and their way of life. It has been almost axiomatic in archeology that once a mound has been disturbed it is usually useless for further scientific study. This statement is true for most practical purposes. There are, however, circumstances where it may be worthwhile to attempt to salvage information and additional data from damaged mounds. Prehistoric remains are a diminishing resource and each year become fewer in number. They are destroyed by dam building and highway construction, expanding cities and more intensive farming among other things. Thus, those still remaining, whether damaged or relatively intact, become more and more valuable with each passing year. It must be recognized from the start that these circumstances necessitate unusually expensive methods for a limited return. In some cases virtually no return. By using different methods and broadening the scope of research to include inter-disciplinary studies this return can be increased to make it not only feasible but desirable and perhaps even necessary.

The National Park Service indeed finds it necessary to take the best care possible of the prehistoric features for which it is responsible. The Act (Tolson, 1933) establishing the National Park Service in 1916 named two fundamental purposes, one of which was,

> "to conserve the scenery and the natural and historic objects and the wildlife therein."

As the mounds are "historic objects" and also the primary resource for which the National Monument was established they must be appropriately cared for to preserve them the longest possible time. Perhaps even more pertinent to the topic at hand is the fact that the mounds contain historic objects within them which must also be protected and preserved.

Under normal conditions of burial, artifacts which would now still exist in mounds can be expected to remain little changed for centuries or even millenia longer. Provided they are left undisturbed. Two feet or more below the surface of the ground environmental conditions are relatively stable with little change taking place. And those changes which do take place are very gradual. Museum authorities have long recognized that environmental change, alternate wetting and drying or cooling and heating is highly destructive to specimens. Therefore mounds with

their stable environment provide excellent storage for the artifacts still in them.

The damaged or "potted" mound is generally easy to identify. It has a large hole or depression in its center. Damage to mounds is unfortunately not limited to the period of active digging. It goes on long after the diggers have left. Their excavations are left open subjecting the interior of the mound to changing temperatures. The sides of the pit slough and erode. Rain and snow collect in the depression instead of draining away. This is also important for a reason beyond simple wetting because the pit soon fills with leaves and other vegetation. Water percolating through this dead plant material often becomes carbonic acid. Not of any great strength true enough, but still, given sufficient time, even a weak solution of carbonic acid is highly destructive to bone and other semi-perishable materials which can be expected in burial mounds.

The second fundamental purpose of the National Park Service is,

> "to provide for the enjoyment of the same (that is the natural and historic objects) in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

This purpose provides other reasons for rehabilitating the burial mounds. Most of the mounds are now or will be located adjacent to monument trails and accessible to the general public. A pitted mound is unsightly to say the least. It distracts visitors from pondering the meaning and significance of the burial structures and makes it necessary to explain how this hole happens to be here. That the mounds must be presented to park visitors in the best possible condition is readily apparent. Also such depressions make turf maintenance for appearance and erosion control extremely difficult and expensive.

The interpretive programs which explain what is known of the mounds and the Indians who built them require research to provide background material and details on the way in which the mound building Indians lived. During the 2,000 or more years of mound building in the Upper Mississippi River Valley, there were at least three identifiable groups of mound builders. From surface indications it is not generally possible to identify which group built a particular mound. They must be excavated. The anomaly is that while the primary duty of the National Park Service is to preserve the mounds they must systematically destroy them with archeological techniques to learn their story. They can be reconstructed of course, but the original would be gone. The mounds inside the Monument are a diminishing and irreplaceable resource.

It is further recognized that archeological methods are constantly improving and that the archeologist of one or two hundred years in the future will be able to extract much more information than we can now. The mounds at Effigy Mounds, Mound City Group or Ocmulgee National Monuments plus some cared for in State preserves are the only ones for which there is any assurance of availability for such long term research needs. For these reasons excavations in mounds under the protection of the National Park Service are carefully limited to only those which can be expected to answer specific problems of high priority.

One hundred eleven of the mounds at Effigy Mounds National Monument were damaged to some extent before it was established. Before starting repair work on the mounds good archeological technique and the need for minimal information on each mound demanded that the extent of damage be thoroughly documented. The first step in documentation was to make detailed surveys and prepare maps showing elevations and outlines, and the location of trees, stumps and depressions. This work was done first for the South Unit of the park under contract with State Archeologist, Dr. Marshall McKusick. One of his students, James P. Anderson, performed the actual survey work in 1960. Anderson (1961) reported the survey with recommendations for treatment by Dr. McKusick.

Park Archeologist John Earl Ingmanson (1964) began mound rehabilitation proper in the Marching Bears Mound Group later the same year. The author continued work in the South Unit in 1962, and rehabilitation in the North Unit began in 1965 under his direction.

The next step in rehabilitating the South Unit mounds was to remove some 160 stumps which were largely the remains of trees killed by Oak Wilt disease. This was necessary to provide for establishing a good sod and to remove the obstructions to mowing equipment. In order to do the least damage to the mounds it was decided to use a mechanical stump remover instead of digging the stumps out manually. The machine was simply a large circular saw blade which slowly chewed the stumps into sawdust. The ability to easily control the horizontal and vertical movements of this blade resulted in very small scars on the mound. Soil was then brought in to fill the stump areas and was then tamped firm.

This left the depressions made by the early "pot hunters" to repair. To determine how much damage was actually done to an individual mound, it was necessary to re-excavate the pits. In doing so, careful records of size and shape, breadth and depth

were kept. Although our excavations have to be larger than the older pits they were kept to the smallest possible size to preserve the intact parts for future research. To simplify record-keeping and make it easier to study contiguous sections of the mound in future years, the sides were straightened and squared.

It was often relatively easy to distinguish between the disturbed and the undisturbed sections of the mound. The disturbed fill inside the pits was usually much darker and mottled because it contained a high percentage of decayed plant material. There were many times, however, when the boundary between the two zones was quite vague and difficult to see. It is fortunate that the contrast was generally good in the deeper sections of the pits. At the bottom of several of the old pits there was evidence that they had remained open for some time. This evidence was the presence of laminated layers of fine silt in alternating light and dark bands.

The undisturbed portion of each mound, immediately adjacent to the pits, was carefully observed at all times for clues that might help identify the builders or features missed by the previous diggers or even date the construction of the mound. These efforts were successful although they frequently did not give any complete answers to archeological problems. The remains of an altar, a radiocarbon date, a single potsherd, and fragments of a burial are items, among many others, that could help guide the intelligent selection of mounds to answer specific problems in research programs of the future.

Sufficient carbon for dating purposes was obtained from several of the mounds. In fact, several dates from the 1961 excavations are now available (Anonymus, 1962). Charcoal from Mound 77, one of the bears in the Marching Bears Mound Group, produced two dates, A.D. 386 and A.D. 636, which are among the earlist of radiocarbon dates for effigy mounds. Linear mound 69 dated A.D. 1531 by charcoal from a disturbed area. This date fits most accepted ideas on the late position of linear mounds.

In 1962 Mound 61 rehabilitation produced several projectile points from the mound fill. One is a *Durst Stemmed* point (Wittry, 1959) of Late Archaic or Early Woodland age, about 1,000 B.C. This point hints of the possible existence of an Archaic living site nearby. Unfortunately the mound cannot be dated from this early period because pottery of Middle Woodland origin, circa A.D. 200 was also found in the mound fill. Three small side-notched points also indicate a later date.

A piece of galena from the Little Bear Mound in 1965 suggests an early relationship of effigy mound builders with the

Hopewell occupation. The rim of a pottery jar with diagonal impressions made by a stick wrapped with twisted cords is typical of the Middle Woodland Period. This sherd, with many others, came from Mound 17 which had been severely damaged in the central area by "pot-hunters."

Mound 17 was selected for further experimental work which required that the excavation be left open at the end of the season making it necessary to dig a trench through an undisturbed section to provide drainage. All of the artifacts came from this trench in the undisturbed outer edges of the mound. One wall of the Mound 17 excavation is being used to test a chemical (trade name Pencapsula, one of the polyurethane resins) designed to harden the soil to prevent erosion and sloughing without discoloring or changing its appearance. Last fall, after four months, the treated wall was hard and dry and free of vegetation; the untreated control wall was wet, soft, showed signs of erosion, and small plants were growing at several points. The mound was inspected the first week in April, 1966. The treated wall was still dry and hard while the control wall had sloughed and was quite eroded. The method does therefore show promise of performing well enough to use.

The rehabilitation of Mound 38 revealed a pit which the "pot hunters" had refilled at random with bones from the multiple burial they found. At one side and near the bottom we did find part of one burial either missed or ignored by them and still undisturbed. Soon after photographing it we quit for the day and returned to be reminded that vandals are still with us today. The skull and other bones had been broken up and scattered and some had been removed.

None of these finds are astounding or spectacular, or even particularly definitive. They do raise questions, hint at relationships, give clues to the age or time of construction for a mound and sometimes identify its builders. Even more important, they demonstrate that vandalized mounds, even badly damaged ones, still have potential value for archeological research and in many cases may provide new and important information about the prehistoric people who built them.

The greatest potential is perhaps in making inter-disciplinary studies in which specialists from other fields can apply their knowledge to archeological problems. Such work has already been accomplished in fact, although not in connection with rehabilitation work. In 1958 and 1959 field work was done by Scholtes, Parsons, and Rieken which was reported in 1961. Their study (Parsons, 1962) of the soils mounds are composed of gave data on the source of mound materials, how much the mounds have

eroded and the vegetation covering the mounds since they were constructed. A method for establishing the relative ages of mounds based on soil development was proposed.

In the 1965 mound rehabilitation program, additional soil samples were collected to enable the extension and further refinement of these studies. A contract was written with William M. Hurley, a graduate student at the University of Wisconsin, to collect the samples. Bulk samples from each layer of earth were collected in plastic bags. A soil monolith, a single unbroken column of earth from the top to the bottom of the excavation, was also taken from each mound. A representative location including all layers of earth present was selected and marked. After which the earth is cut away from both sides of the sample site leaving the sample standing out from the wall of the excavation. A chemical is then applied to help harden the column and prevent breaking on removal. When the chemical has dried, a board is tied to the sample with cloth strips which have been passed through holes cut behind the column. Finally it is broken loose and then wrapped and tied for removal to the laboratory.

In addition to adding more data, including more associated radiocarbon dates, to the previous studies we are proposing new studies. These will include the study of fossil pollen trapped when the mound was built. Combined with soils studies and archeological data they will aid the reconstruction of the prehistoric environment and climate at different time levels of the past.

After the size of the relic hunters pit was determined we backfilled the pits. To mark the limit of our work, we placed a layer of sand at the bottom of our excavations. On the walls of the pit we hung strips of colored plastic for the same purpose. The fill was tamped to avoid settling and the need to return for additional work. The mound was rounded on top just enough to drain water away. When starting our digging we saved the sod and stockpiled it for use at this time. Where there was no sod or insufficient quantities of it we sowed grass to get a turf started for good appearance as well as erosion control.

There are now quite a few mounds inside state, county and city parks and even in small community preserves. New land units are being set aside by the increasing activity of such organizations as the Iowa Conservation Commission, State Preserves Board, County Conservation Boards and other governmental and private conservation groups. Some of these will include, probably by accident rather than intention, burial mounds or some other site of prehistoric interest.

The value of such resources, even when damaged, has been

demonstrated and they merit the best care possible. Many will show the scars left by the relic hunter; pits and holes, often filled with rubbish and dead vegetation. It is recognized that projects as described above are much too expensive for most budgets. There are a few basic preservative measures which are within the reach of most pocketbooks, and which do not require the presence of a professional archeologist.

The first of these basic steps is to document the current condition of the mound. A detailed drawing should be prepared showing the outline of the mound and the elevation. The location of trees and stumps should be noted. Also show the size and depth of any depressions in the mound. Before measuring depth, litter should be removed from the holes. At least one and preferably two permanent reference points should be placed to one side of the mound and all measurements to major features should be recorded from them. One copy of this drawing should be filed with the State Archeologist, University of Iowa, Iowa City. Other copies should be kept by the managing agency and perhaps filed with the County Clerk, or local library.

The second step would be to repair the mound. This would consist of cleaning the holes of loose rubbish and filling them with clean dirt, doming slightly on top so water will drain away from the mound. No hole should be filled unless it has first been recorded as outlined in step one. If stumps have to be removed great care should be taken to remove only a bare minimum and prevent further damage to the mound. If feasible a good turf should be established and kept neatly trimmed.

These minimal measures will show mounds at their best and still preserve remaining features. At the same time it will enable the scientific study of undisturbed portions at some time in the future. The day will come, although it may be a century or more, when some archeologist will have the money, the time and a problem to solve which may require the study of this particular mound, wherever it might be.

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